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Transplanting and Row Cover Effect on Corn

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Abstract
Sweet corn growers in eastern U.S. have transplanted sweet corn started in green houses for earlier harvest and to avoid cold soil germination problems. Floating row covers were used to promote early growth and to provide some protection from frost. The objective of this study was to determine what effect these practices would have on field corn.

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Transplanting and Row Cover Effect on Corn

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Introduction

Sweet corn growers in eastern U.S. have transplanted sweet corn started in green houses for earlier harvest and to avoid cold soil germination problems. Floating row covers were used to promote early growth and to provide some protection from frost. The objective of this study was to determine what effect these practices would have on field corn.

Materials and Methods

The experiment had four replications and two treatments–transplanted corn covered with a row cover and direct seeded corn. Corn plants were started in a greenhouse with one seed/cell in 96 cell trays with cell dimensions of 1 in. diameter and 3 in. depth. When the plants reached the Ve to V1 stage, they were transplanted into the field on April 29, 2011 and April 11, 2012. After transplanting, the plots were watered and covered with 90 in.-wide Gro-Guard 6GG20 polypropylene row covers supported by wire hoops. The row covers were removed when the corn leaves reached the top of the row cover on May 24, 2011 and May 18, 2012. Corn of the same full season hybrids, Dekalb DK61-69 in 2011 and Mycogen 2J567 in 2012, was direct seeded the same days that transplanting occurred. Final stands in 2011 were 35,000 and 37,000 plants/acre for transplanted plots and direct seeded plots, respectively. In 2012 all plots were later hand thinned to 35,000 ppa. Plots were 2 rows × 15 ft. The plots were hand harvested and grain yields were corrected to standard 15.5 percent moisture.

Results and Discussion

Wet weather delayed transplanting until April 29, 2011. Direct seeded corn emerged within four days of planting in 2011 due to warm soil temperatures and in 2012 emerged in 14 days. On May 3 and 4, 2011, temperatures were below 32^{o}F for 7 hours and 2 hours, respectively. On April 12, 2012 temperatures were below 32^{o}F for 6 hours. In 2011, there was foliar frost damage, but no corn plants were lost due to frost in either year. In 2011 the line between yellow and green colored tissue was assumed to be the soil line in the pots and the transplant depth, but this proved too shallow. The shallow depth likely stressed the plants and reduced yield, as nodal roots were visible above ground early in the season on some plants. At row cover removal, transplanted corn was taller than direct seeded corn both years. Transplanted corn reached 75 percent silking and black layer sooner, and had lower grain moisture levels, but yields for direct seeded and transplanted corn were statistically similar (Table 1). Exact reasons for these results cannot be fully explained by this experiment, thus further study is needed.

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Table 1. Effect of transplanting and row covers on corn.

	2011		2012	
	Transplanted	Direct seeded	Transplanted	Direct seeded
Yield bu/A	233a[t]	262a	202a	215a
Moisture	18a	23b	17a	20b
75% silk date	July 11	July 17	July 10	July 12

[t]Means in the same row followed by the same letter within the same year and variable are not different. P ≤ .05.